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A proposal for a MARINA COMPLEX at INDIAN CREEK



THE PLANISTICS GROUP

TERRAPLAN BUILDERS INC.

BERMINGHAM CONSTRUCTION LTD.

TREVOR P. GARWOOD-JONES, ARCHITECT

THE CONTENTS OF THIS PROPOSAL

	<u>PAGE</u>
FOREWORD	1
SUMMARY	2
PART ONE: THE LEISURE BACKGROUND	3
1.1 RECREATIONAL PATTERNS IN ONTARIO	3
1.2 EXISTING BOATING FACILITIES IN THE LOCAL VICINITY	4
1.3 DEMAND FOR A NEW MARINA	6
PART TWO: INTRODUCING THE INDIAN CREEK PROPOSAL	7
2.1 CRITERIA FOR MARINA SITE SELECTION	7
2.2 THE INDIAN CREEK SITE	8
2.3 THE PROPOSED MARINA DESIGN CRITERIA	11
2.4 ARCHITECTURAL CONCEPTS	17
2.5 PROPOSED FACILITIES AND SERVICES	24
2.6 ENGINEERING AND CONSTRUCTION	27
2.7 DEVELOPMENT COSTS	36
PART THREE: THE MARINA COMPLEX	42
3.1 AS A VISUAL AMENITY AND FACILITY ALONG THE BEACH STRIP	42
3.2 DEVELOPMENT WILL BE PHASED	43
3.3 THE MARINA WILL BE OPEN TO THE PUBLIC	44
3.4 AS A CLUB HEADQUARTERS	44
3.5 AS A BASE FOR HOTEL DEVELOPMENT	45
3.6 MARINA MANAGEMENT	46
PART FOUR: FINANCING THE PROJECT	48
4.1 MARINA ECONOMICS	48

FOREWORD

This report presents to the Hamilton Harbour Commissioners a joint venture development proposal for a Marina Complex at Indian Creek. The initial research phase involved, determining the present and future demands for marina facilities, consideration of potential sites and analyzing marina economics. In view of the research results, the Indian Creek site in Burlington Bay was chosen as the best site for marina development.

A development plan was formulated considering the site's amenities, constraints and breakwater requirements. The resulting design has wet berthing for 818 boats and the concept incorporates public and club facilities. The project as planned could be phased over a number of years.

This report considers the development plan with respect to:

- . demand for the proposed marina complex
- . the Indian Creek site
- . design and proposed facilities
- . engineering and construction
- . development cost and marina economics

It is hoped that this proposal will form a base from which the Development Team and the Hamilton Harbour Commissioners can work towards a finalized development plan and a joint venture agreement.

THE DEVELOPMENT TEAM

PLANNING AND ENGINEERING

Planistics Group

PROJECT MANAGEMENT

Terraplan Builders Inc.

MARINE CONSTRUCTION

Birmingham Construction Ltd.

ARCHITECTURE

Trevor P. Garwood-Jones, Architect

PART ONE: THE LEISURE BACKGROUND

1.1 RECREATIONAL PATTERNS IN ONTARIO

Increasing Leisure Time

In North America today, the work ethic is rapidly giving way to one more pleasure-oriented. Now, more than ever before, North Americans are becoming a people genuinely concerned with enjoying life. They are constantly searching for a wider variety of entertainment and recreation activities.

The population growth coupled with automation are major factors contributing to the increase of leisure time, and leisure time activities. More specific factors include trends toward shorter work weeks, longer paid vacations and increased longevity.

With respect to the use of increasing leisure time, perhaps the best information regarding recreation activities in Ontario is contained in the participation rates recorded by the CORD studies.¹ This document presents the rates or participation of the population in various outdoor activities over the period 1967 to 1972, so that a comparison of the rates allows one to determine which activities are experiencing growth and which are experiencing decline. For the Province of Ontario, a comparison of the rates yields the following results:

<u>Activity</u>	<u>Annual Increase/Decrease in Recreation Participation (1967-1972) in Ontario</u>
	<u>Percent*</u>
Power boating	+ 4.2
Sailing	+ 16.0
Canoeing	+ 7.5
Tent camping	+ 9.2
Trailer camping	+ 13.3
Pick-up camper	+ 20.0
Sightseeing	- 5.6
Swimming	+ 6.3
Fishing	+ 0.7

* Not compounded

Source: Table 22, CORD Technical Note No. 23

1) *Outdoor Recreation Research Section, Nation and Historic Parks Branch, Parks Canada, Trends in Participation in Outdoor Recreation Activity, CORD Technical Note No. 22, 1973.*

Boating in Ontario

It is readily apparent from the above chart that boating is experiencing growing favour with the people in Ontario.

In particular, recent trends have indicated that sailboating is enjoying a renewed popularity and is experiencing rapid growth. The bulk of boating growth, however, is occurring in the smaller craft, mainly because of their cheaper price and their consequent ability to reach a larger market. It is expected that this trend will continue and though larger cruising sailboats will increase, they will not approach the growth rates of the smaller craft.

Similarly, large power boats will also show an absolute increase over the years. But because these crafts are largely a pass-time of the well to do, they will not experience the growth rates of the smaller craft and will probably remain a lesser proportion of the overall boating activity.

1.2 EXISTING BOATING FACILITIES IN THE LOCAL VICINITY

Locally, within Hamilton Harbour and the adjacent Lake Ontario shoreline between Oakville and Fifty Point Conservation Area, there are approximately 808 existing boat slips.

<u>Location</u>	<u>Existing Boat Slips</u>
Oakville	224 - 164 private and 60 public
Bronte	184 all private
Hamilton Harbour	400 (see Table 1)

These existing facilities also have little or no room for expansion and are therefore incapable of providing the public with sufficient berths to meet present waiting lists. Table 1 shows the capacities of present facilities in Hamilton Harbour.

Table 1*

EXISTING HAMILTON HARBOUR MARINA FACILITIES

Location Description	James St. Marina (H.H.C.)	R.H.Y.C.	Macassa Bay Y.C.	LaSalle (H.H.C.)	Leander (H.H.C.)	Private
Berthage	217	138	35			10
Moorings		22	4	91	21	6
Dry Sailors		150				
Acres of Back-up Land	3.8 acres	4.2 acres	3.25 acres not fully used			
Waiting List	149 people	40 people	15 people			

* Reprinted from a study entitled, "Preliminary Engineering Study of New Marina Alternatives in Hamilton Harbour", prepared for Hamilton Harbour Commissioners.

1.3 DEMAND FOR A NEW MARINA

Recently, two studies have considered the condition of existing recreational marina facilities in relation to their local demand. These reports are:

- . "The Halton-Wentworth Waterfront Study" prepared for the Waterfront Co-ordinating and Technical Committees by Acres Consulting Services Ltd. and Project Planning Associates Ltd.
- . "Preliminary Engineering Study of New Marina Alternatives in Hamilton Harbour" prepared by Public Works Canada for the Hamilton Harbour Commissioners.

Both reports agree that the growing demand for recreational marina facilities has outstripped the supply in most marinas in the "Golden Horseshoe" area. The "Waterfront Study" estimates that based on projected increases in population, leisure time and discretionary income, there will be a need for about seven times the existing small-craft docking space during the next 15 to 20 years.

The marina development presented in this report is the first proposal for the Harbour since these studies were released and when developed will represent a major step toward fulfilling a pressing recreational need in the Hamilton-Burlington vicinity.

PART TWO: INTRODUCING THE INDIAN CREEK PROPOSAL

2.1 CRITERIA FOR MARINA SITE SELECTION

In the selection of the site for the proposed marina complex, certain basic criteria were established in order that the best site was selected. Generally, the criteria for site selection were divided into two parts, those dealing with the non-physical aspects and those with the physical side of location. Each site that was considered was assessed with a view to the established criteria and though not all principles were applied in each case, an attempt was made to assess as large a number as possible within the limits established by time and budget constraints.

The non-physical criteria included the determination of the characteristics of existing use and users including land ownership, and an evaluation of the demands for the services a marina will provide at that location. Where possible, sites with a potential for future expansion of both accommodation and related facilities were preferred. In addition, locations that would open new areas to both boaters and tourists such as parks, and tourist attractions and/or would improve the economic conditions in the surrounding area were given preference.

The physical criteria involved an assessment of those physical elements which would affect the siting of the marina and which would have a large influence on the cost of construction. These included:

- . A study of the wind and wave conditions to determine the feasibility of a marina location. Sites that required extensive breakwater construction to protect the channel entrance and marina basin area were avoided;
- . An evaluation of the hydrographic information to determine most favourable depth of water for marina channel and basin. Sites with deep or shallow water areas which required either extensive dredging and disposal areas or long foundation piling were downgraded;
- . An assessment of the soil information and the effect of ice conditions at the site in regard to their effect on possible design and construction;
- . A determination of sites that required a minimum of site preparation work such as grading, clearing, excavation and fill;

- . A preference for sites that are accessible from major highways and require a limited length of access road construction as well as the sites that have utilities available in the immediate area;
- . A determination of the extent of maintenance, primarily dredging of entrance channel and marina basin;
- . An evaluation of water and land area requirements for proposed type of development and possible future expansion; and,
- . An assessment of the effect new construction will have on existing operating boating facilities and surrounding area.

In regard to recreational marina site criteria The Halton-Wentworth Waterfront Study recommends:

- . In general, the marinas should be located in a regional or community park in order to maximize investments through multiple use of public lands and facilities. The larger marinas should be located within a few minutes of stores, restaurants, banks, recreation opportunities and fire fighting equipment, municipal sewers should be available for pump-out facilities.
- . Marina sites should be publicly owned, but part of each site should be made available on long term leases to private clubs. If a marina site at one of the proposed locations is developed by private investment prior to public work, arrangements should be made with developers to allow for immediate public use of part of the facilities, and the design should allow for later expansion to include the number of slips recommended ...
- . The study states concerning the proposed Indian Creek site that:

A public/private marina, recreational harbour and community park should be established near the mouth of Indian Creek. Together with boat slips at the recommended adjoining tourist commercial development, a total of 750 boat slips should be eventually provided.

2.2 THE INDIAN CREEK SITE

In line with the above criteria, a number of possible Hamilton Harbour and Lake sites in the Hamilton/Burlington vicinity were considered. Based on our evaluation for the proposed number of berths and on-shore

facilities Indian Creek is the site of our choice (Figure 2.2-1). As this site was also considered in the Hamilton Harbour Commission New Marina Alternatives Study their description of the site is included below:

Indian Creek

Indian Creek is situated in the north-eastern corner of the harbour with easy access from the Queen Elizabeth Way. It possesses a natural park setting in a partially residential area. This site provides convenient access to the lake for those sailors who prefer the lake winds. Potentially, this could reduce traffic congestion within the harbour.

The site lies directly under high-voltage hydro lines. By observing certain requirements set out by Ontario Hydro, a marina could be built at this location. Expected requirements are as follows:

1. no flammable operations would be permitted directly under the lines;
2. only materials or products of a fireproof nature may be stored directly beneath the lines;
3. Ontario Hydro has a right-of-way of 100 to 150 feet for purposes of maintaining their structures.

If and when the Burlington Canal Tunnel proposal is adopted, then land expropriation by the Ontario Ministry of Transportation and Communications would likely require a right-of-way extension of 200 feet from its present location. However, it is understood that this project may not commence within the immediate future. The site is presently owned by the Hamilton Harbour Commission.

Site development would require both dredge filling and land filling as well as costly breakwater construction because of water exposure. The traffic noise from the Queen Elizabeth Way may provide an adverse effect for potential marina customers although the site is situated well away from the Burlington Skyway. The site would provide a capacity of 900 berths with some possibility of expansion.

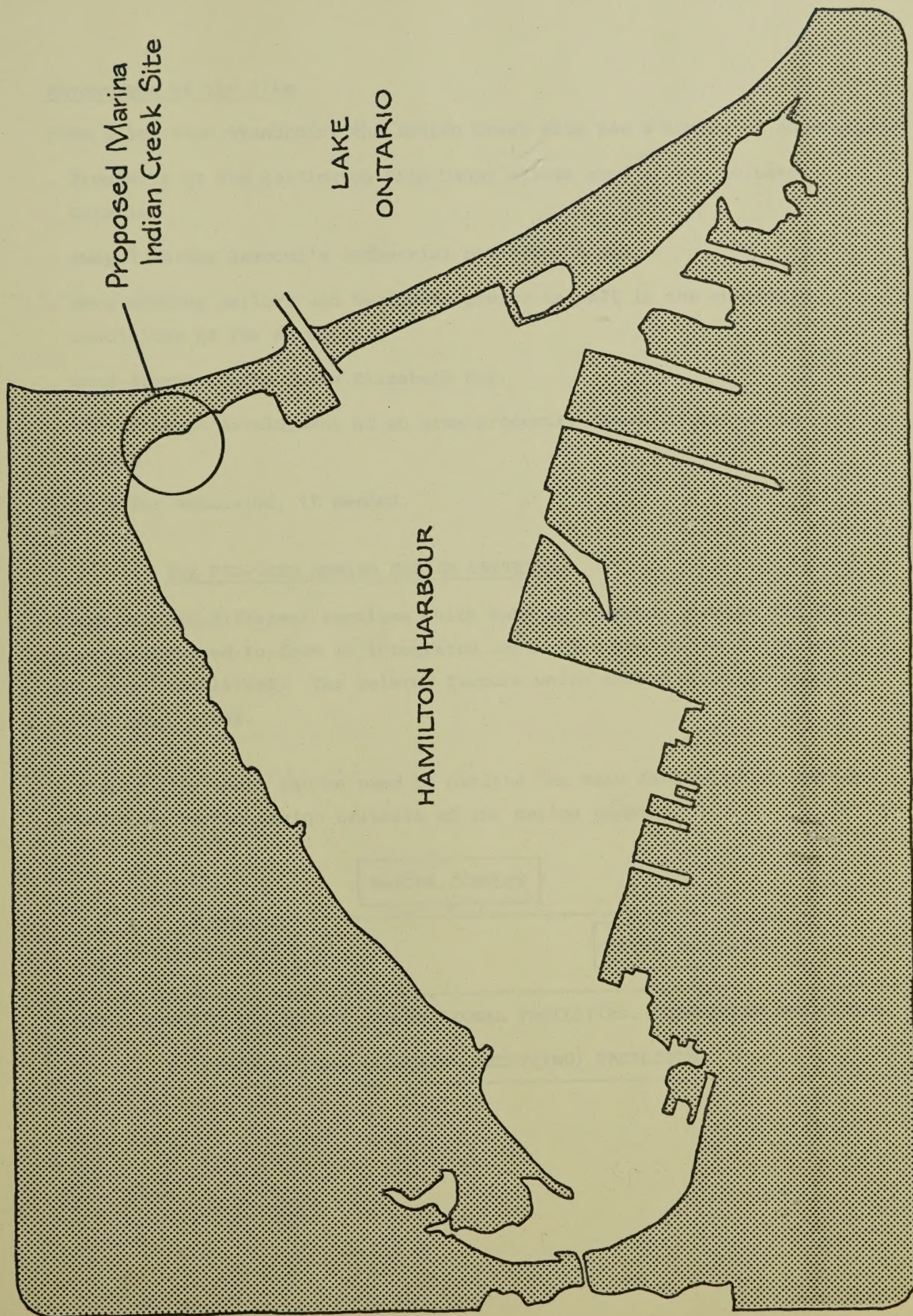


FIGURE 2.2-1 THE PROPOSED MARINA SITE

Advantages of the Site

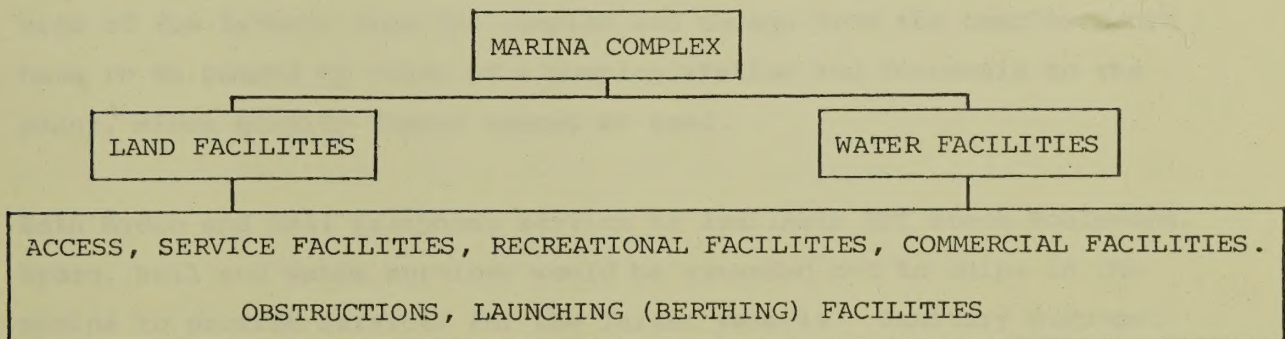
From a location standpoint the Indian Creek site has a number of advantages:

- . Proximity to the Burlington Ship Canal allows good access to Lake Ontario.
- . Away from the Harbour's industrial pollution zones.
- . Many evening sailors and beginners prefer to sail in the sheltered conditions of the Harbour.
- . Good access to the Queen Elizabeth Way.
- . Recreational development of an area presently inaccessible to the public.
- . Room for expansion, if needed.

2.3 THE PROPOSED MARINA DESIGN CRITERIA

There are two different sections which make up a marina complex and these must be combined to form an integrated unit. The two sections are land and water facilities. The related factors which affect each, in turn, affect each other.

A simple flow chart can be used to outline the main factors which must be considered in the design criteria of the marina complex.



ACCESS

The site is located in the north-east corner of the Hamilton Bay, on the isthmus of land between the Cities of Hamilton and Burlington. This location provides readily available road access from the east of the site by way of Beach Boulevard. The site will require the construction of 2,400 feet of permanent road from Bagotts Street to the site along the south side of the isthmus with some sections being built on land fill material.

It is also feasible to surmise at this time that an entrance would eventually be obtained off the existing ramp from the southbound lane of the Queen Elizabeth Way.

The location of the site is accessible from any point within the Bay and also from Lake Ontario.

The third possible access to the site is by way of air taxi and provisions for this mode of transportation are also feasible at this location.

SERVICE FACILITIES

Presently a watermain is located on Beach Boulevard and this could be tapped to provide water to the complex.

The City of Burlington Sewage Treatment Plant is located on the opposite side of the isthmus from the complex and sewage from the complex would have to be pumped by means of a pumping station and forcemain to the plant, since gravity sewers cannot be used.

Both hydro and Bell telephone service is available off Beach Boulevard. Hydro, Bell and water services would be extended out to ships in the marina to provide services for the larger vessels. Sanitary pump-out facilities for the vessels would be centrally located within the marina which would allow the individual vessels to empty their holding tanks on demand.

PHYSICAL CONSTRAINTS

The site is bounded on two (2) sides by physical barriers.

- 1) The Queen Elizabeth Way right-of-way which extends almost to the present shore line makes it necessary to provide land fill areas for the complex. The amount of land fill required is dictated by the one to one ratio of land to water requirement for a facility of this nature.
- 2) The Indian Creek, located on the west limit of the site, limits expansion of the site to the west.

To the east of the site the outfall sewer from the City of Burlington Treatment Plant enters Hamilton Bay and the outlet is beyond the proposed location of the marina breakwater. This sewer does not restrict expansion of the marina complex to the east, however, since the structure is very shallow, no berthing facilities could be located directly over it.

Ontario Hydro towers and lines are located approximately 800 feet from the present shore line and cross over the site causing some restrictions as outlined in the previous sections.

NATURAL ENVIRONMENT CONDITIONS

The normal wind in this area is from the west and crosses the full length of Hamilton Bay, thus waves of three (3) to four (4) feet could be generated. Waves of this magnitude would inflict an impact force on a solid break water of $6 \pm$ tons per linear foot. Also the rebound of waves off a solid break water could set up a resonance reaction at a marina harbour entrance which would make entering and leaving a marina harbour very difficult. However, this was considered during the design and the problem prevented.

Heavy storms normally are from the south-east and will not have any great effect on the marina because the land mass (isthmus) will block both wave and wind forces.

The currents within the Bay as outlined in the Ministry of the Environment's "Hamilton Harbour Study", May, 1974, Page E-8 indicated that the water circulation is normally counter clockwise at the marina site.

Siltation of the dredged out areas will also be affected by the currents which have a mean velocity of 3.6 and 2.2 centimeters per second at 16.1 and 6.1 meters from the bottom.

Seasonal changes in the Bay will have limited effect on the marina structures, however, a bubbler air system will be required to eliminate damage which may result from ice action.

COMMERCIAL FACILITIES

The site is ideal with respect to convenient access to Burlington and Hamilton business areas and thus restaurant, hotel, evening entertainment and other local businesses are readily available.

It is proposed that a show room for a yacht manufacturer be located within the marina complex along with a repair shop and a marina supply shop. This could be beneficial to the complex in that the vessels using the marina can be serviced easily for all types of repairs and professional staff would be available for consultation on various problems. The benefit to a manufacturer would be:

- 1) their product can be seen in use;
- 2) the site is accessible from the Queen Elizabeth Way and can be seen by a majority of individuals;
- 3) berthing facilities are available for potential clients; and
- 4) availability of mobile and fixed hoists to load and unload boats, and launching ramps.

Within the marina complex and centrally located, a second centre (Dockmaster's Office) is to be provided and will have the following services.

- 1) gas and diesel fuel pumps
- 2) sanitary pump out system

- 3) security office, weather office, chart room
- 4) central office for pick-up and delivery service (ice, groceries, papers, etc.)

RECREATIONAL FACILITIES

A park with picnic facilities and walkways is to be located in the east end of the site through which the main entrance road will traverse. Other facilities planned for this area include tennis courts and a public comfort station with showers, change rooms and lockers.

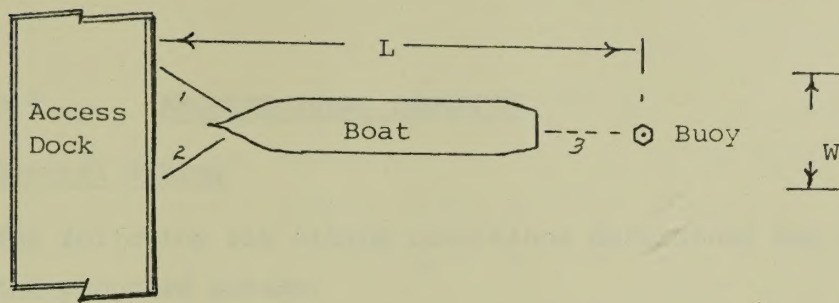
The main objective of the marina complex is to provide the public with boating and sailing recreational facilities, however, the other recreational facilities will provide the complete recreational package for the whole family.

BERTHING AND LAUNCHING FACILITIES

To handle the requirements of the "Dry Berth" sailor, a separate launch ramp will be necessary in the shallow section of the harbour. To accommodate the dry berth sailor, it will be necessary to provide sufficient land area for the parking of boats on trailers near the ramp.

For boats requiring wet berths, the launching facilities will consist of a ramp into the deeper section of the harbour and a mobile hoist. The hoist will have to be mobile in order to allow it to travel to and from various boat storage areas on the site, load and unload vessels from float trucks and be of sufficient capacity to handle the larger vessels to be berthed or put in winter storage at the marina.

The wet berths to be provided are based on the Mediterranean design for marinas. This type of berth provides two point ties to the access dock and a one point tie to a buoy.



The sizes of ships (berths) provided for in the marina are:

Type	Size W x L	Boats Accommodated
1	12 x 30	to 26'
2	15 x 38	to 30'
3	18 x 48	to 40'

Provisions have been made to accommodate a limited number of boats longer than 40 feet.

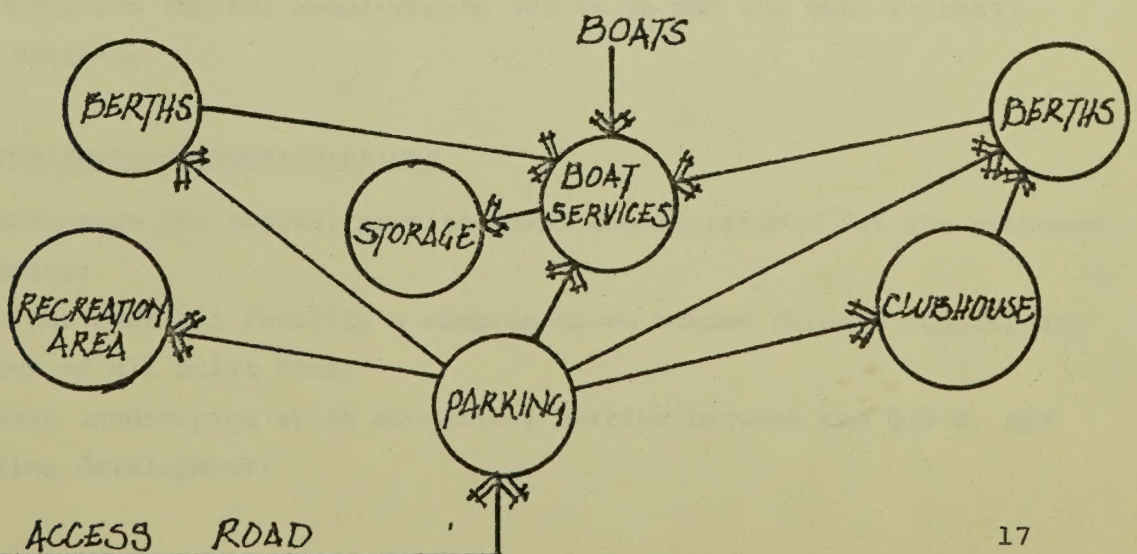
Anchorage within the breakwater area will be provided during the first two phases of the three phase construction program with a possibility of a permanent anchorage area east of the completed complex.

General Siting

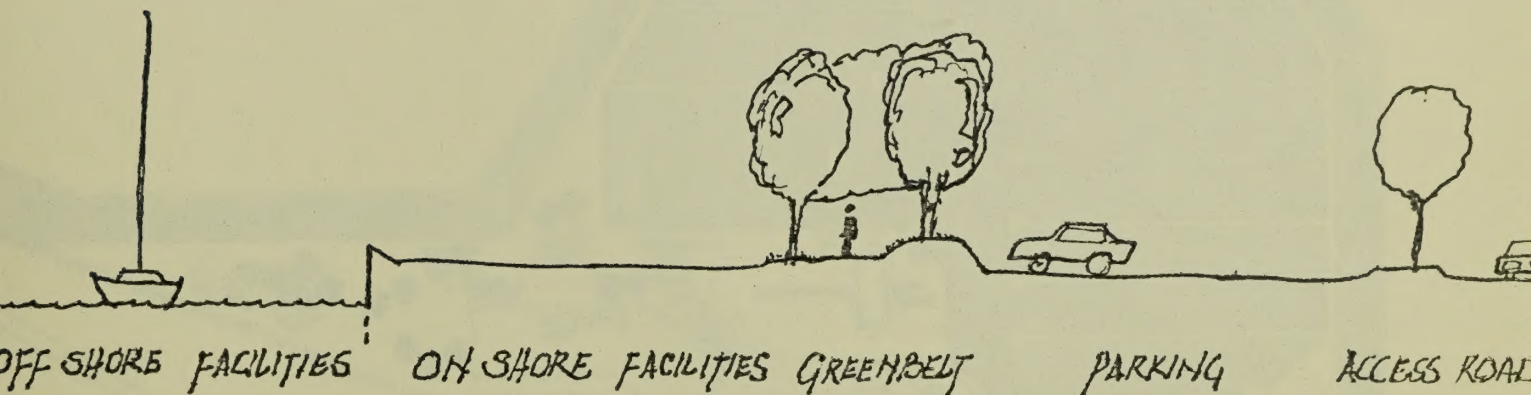
1. A one-to-one ratio of onshore-to-offshore areas;
2. The engineering hydraulic requirements;
3. The bulkhead, demarking the extent of landfill, which follows the natural shoreline;
4. The eastern boundary of the site, established by the extent of the proposed widening of the Q.E.W.:
5. Clearance of facilities along the hydro right-of-way;
6. Vehicular access from the southern portion of the site.

The following principles and requirements determined the over-all master site plan layout: (Figure 2.4-1)

1. The marina site was to have a satisfactory mix of recreational activities for both public and private use.
2. The arrangement of the facilities was arrived at via a series of relationship diagrams. Through this process a Master Site Plan was developed. A centrally located high activity area provides car parking, boat services and storage. Berths, recreational areas and clubhouse are connected to this central area by a network of paths and roadways.



3. The layout for the Master Site Plan, in concept, was a vehicular access road running along the eastern boundary of the site with service and parking areas directly related to the road. These vehicle areas were separated from other facilities by a "green belt" containing the major north-south pedestrian pathway system from which access to all facilities might be gained.



4. The following general requirements also contributed to the development of the Master Site Plan:
- . The proposal had to satisfy the marina design criteria set out in 2.3.
 - . The completed size of onshore facilities had to be related to the berthing accommodation of 818
 - . The development of the proposed marina had to be capable of being phased
 - . Security and control requirements had to be met for boat storage and berthing.

General Architectural Considerations

The following were the general architectural considerations for the proposed marina complex:

- . to make the over-all facility a comprehensive scheme through consistency in design of all built form;
- . to utilize landscaping as an acoustical barrier between the Q.E.W. and the marina development;

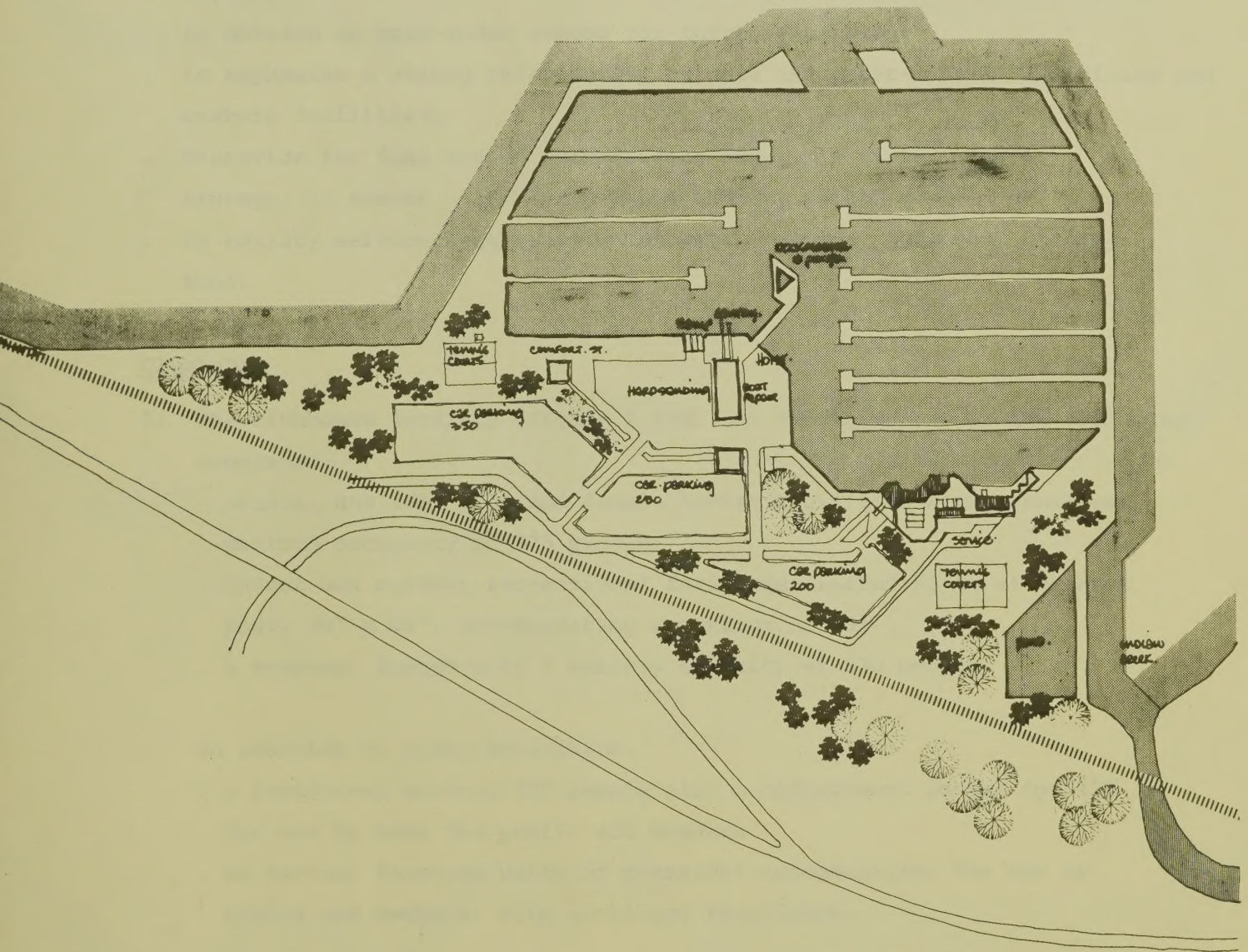


Figure 2.4-1





- . to maximize attractive views and vistas;
- . to provide public access and participation wherever possible with a pedestrian connection to MacDonald Park and the Burlington Beach strip beyond;
- . to develop an open-ended scheme for future expansion;
- . to emphasize a strong relationship between the water-related activities and onshore facilities;
- . to provide for dual use of hardstanding area: in winter - boat storage; in summer - trailer parking and dry sailor area;
- . to satisfy service requirements for water, sewage, hydro and boating fuel.

Clubhouse

1. The clubhouse facility (Figure 2.4-2) has developed out of the following programme:
 - . saunas, and full male and female locker facilities with a combined maximum occupancy of 375 people;
 - . Indoor and outdoor recreational facilities including an all-season pool, 30' x 60', accommodating a maximum of 90;
 - . a members' lounge with a maximum capacity of 230 people.

In addition to these facilities:

- . a restaurant serving 300 people plus a refreshment lounge for 130 for use by both the public and members
- . an initial fourteen units of overnight accommodation for use by public and members, with ancillary facilities.

2. Phasing of the clubhouse facility was proposed as follows:
 - Phase I - Refreshment Lounge, Locker Rooms, Entrance and Administration
 - Phase II - Restaurant, Pool, Members' Lounge and support facilities to complete the Basic Clubhouse
 - Phase III - Completion of overnight accommodation and recreational facilities.

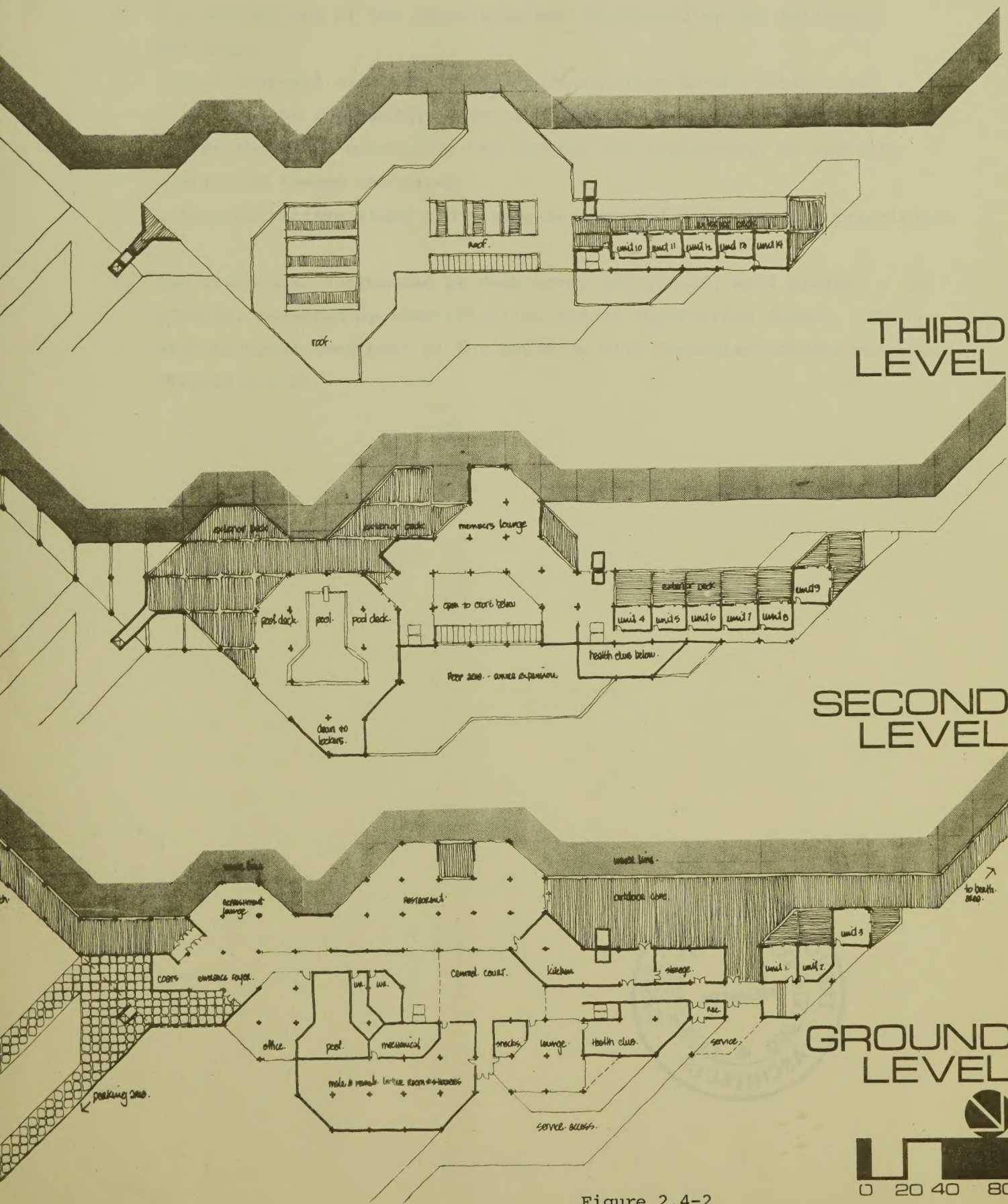
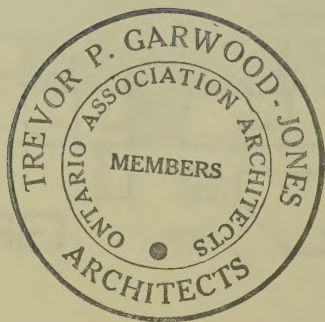


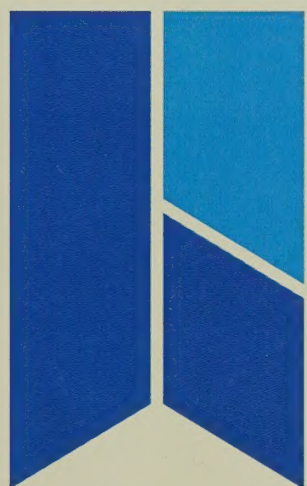
Figure 2.4-2



3. The arrangement of the facilities was determined by the following criteria:
 - . that over-all site circulation be accessible to the public, yet still be an independent element within the over-all scheme;
 - . that the club, especially the lounges and restaurant, be strongly oriented toward the water;
 - . that attractive views and vistas be accorded high planning priorities.
4. The clubhouse, surrounded by deck areas and plazas, will present a low profile, accented by identification and/or observation towers. The architectural treatment of the building will emphasize natural materials. (Figure 2.4-3).

Placeholder for Foldout.

Insert to Be Photographed at
a Later Date.



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As proposed, various activities within the Marina Complex will be in operation year round. During the summer a complete range of boating facilities will service local and visitor customers, while in the shoulder and winter season storage and maintenance of boats and motors will be provided. A hotel, restaurant and a clubhouse with additional recreational facilities is proposed for operation year round.

The proposed facilities and their operation when complete will constitute a major recreational addition to the existing waterfront facilities in the Hamilton/Burlington vicinity.

In brief, the proposed marina complex facilities are as follows:

Facilities and Services Offshore

- . finger piers, up to 818 slips to accommodate local and transient boats up to 50' in length
- . launching ramps (2)
- . water and electric service for boats
- . 50 ton boat hoist
- . fueling station
- . pump-out station
- . dock master's office
- . fire and security protection

Facilities and Services Onshore

- . access road
- . auto and trailer parking area
- . sales and service building including boat repair
- . administration service building with
 - office with telephone, government charts available, weather reports
 - comfort station with showers and laundry
 - limited supply of marine hardware and supplies

- . boat storage facilities/dry land marina
- . charter service/boat rental
- . public tennis courts
- . park setting picnic area

Club House Facilities

- . 14 room hotel and restaurant with banquet rooms, meeting rooms and member facilities (bar, lockers, showers)
- . recreational facilities, swimming pool, sauna, squash, tennis, childrens' playground
- . grocery and delivery service
- . mail service
- . laundry pick-up

Hotel and Club Member Facilities

Though the marina itself may not provide ample profit motive, the facility along with additional revenue return from the proposed hotel and club uses should be sufficient to insure a reasonable return on investment.

Active club membership privileges will include use of the clubhouse and social/recreational facilities along with a docking berth and winter storage space, if required. Inactive memberships will also be available and will only include clubhouse social/recreational privileges. The hotel unit will be integrated into the clubhouse and will offer a limited number of overnight accommodations for transient boaters and the public at large. Within this section of the marina will be the main restaurant and recreational facilities such as a swimming pool, sauna etc. The use of these facilities, with the exception of the restaurant, will be restricted to club members, their guests and persons registered at the hotel.

Public Use

Half of the offshore berths (409 ultimately) will be available for direct lease to the public without club membership. Even though the public will not use the clubhouse or associated social/recreational facilities, the southern portion of the site is proposed for ancillary public use such as a tennis and picnic area. Adjacent to this would be a public comfort station with shower and toilet facilities.

Land Use

It is proposed that the proposed land use be restricted to the use of the site for the purpose of the club. The site is to be used for the purpose of the club and the site is to be used for the purpose of the club. The site is to be used for the purpose of the club and the site is to be used for the purpose of the club.

Relating to

A retaining wall will be required for the site. The wall will be required for the site and the wall will be required for the site. The wall will be required for the site and the wall will be required for the site.

There is a 10' x 10' area of the site which will be used for the purpose of the club. The area will be used for the purpose of the club and the area will be used for the purpose of the club.

Introduction

This section has been established in order to have basic design criteria to work from on the marina proposal. The material types, size of structural components, etc. have been established from a pre-engineering design aspect and should not be construed as the final engineering design for the project. The proposed marina will accommodate 818 wet berths as indicated in Figure 6-1.

Land Area

It is proposed that the required land/water relationship necessary for the development should be on a 1:1 basis. To accomplish this, a program for land fill will be established by constructing a retaining wall within the shallow areas and pump the dredged material from the areas to be deepened into this confined area. The total area that the complex will cover is approximately 50 acres of which 25.93 $\pm$ acres will be made up of land fill.

Retaining Wall

A retaining wall would be required for the full length of the shoreline which would be approximately 3500 linear feet. Figure 6-2 has been attached showing the general detail for the retaining wall. The retaining wall would be built first in approximately 3 - 5 feet of water in order that the land filling by pumping the dredge material behind the retaining wall could follow the construction of the wall.

Piles of the 14" x 14½ x 89 bearing pile type would be driven at 20 foot intervals and 1' x 3' x 20' solid pre-cast concrete panels fitted between these piles. Each column would be anchored using a 2" diameter (with an upset of 2½" diameter) tie rod to a dead head anchor in the fill material. The retaining wall would then be capped with a 2' wide concrete walkway.

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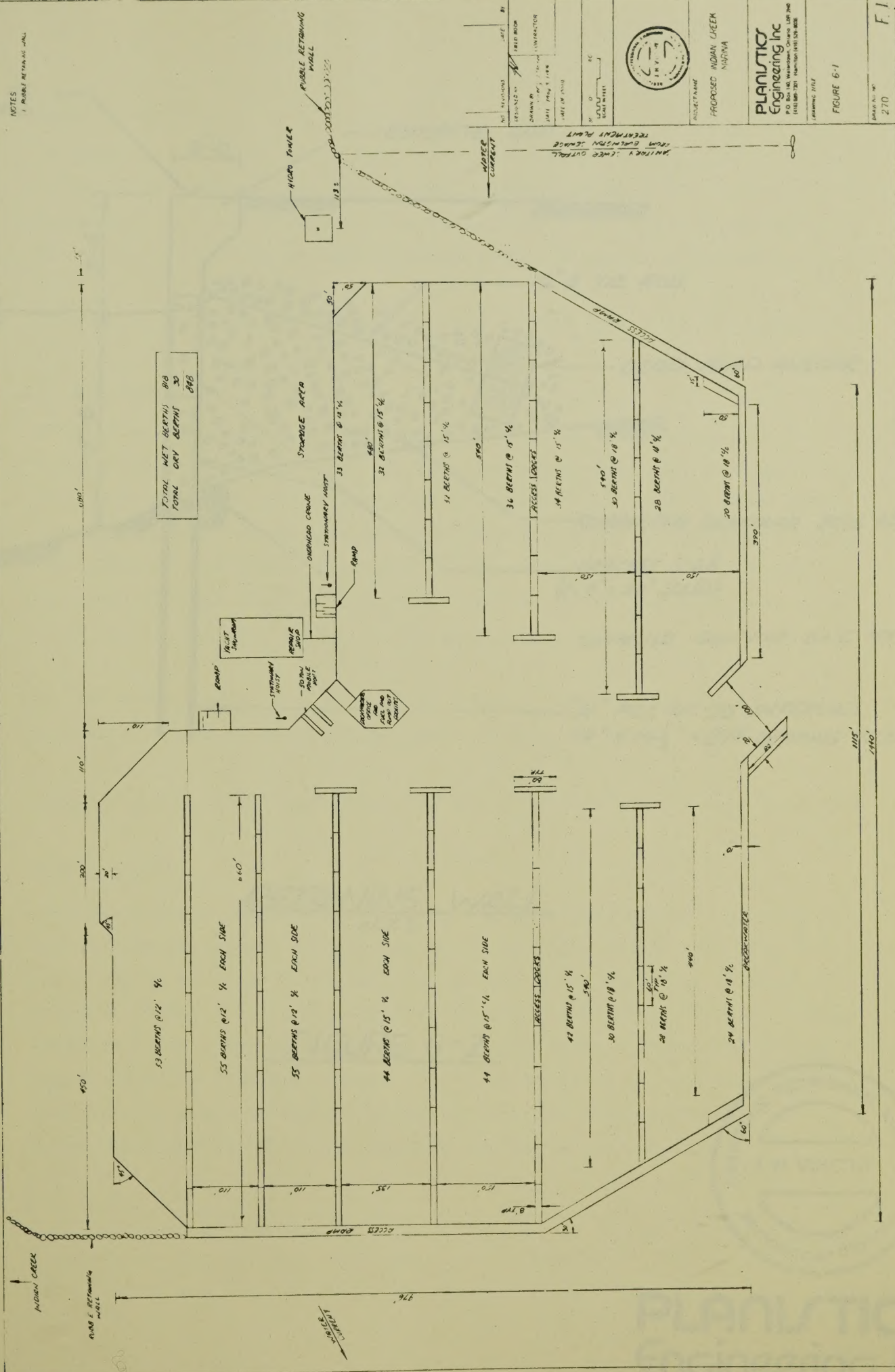
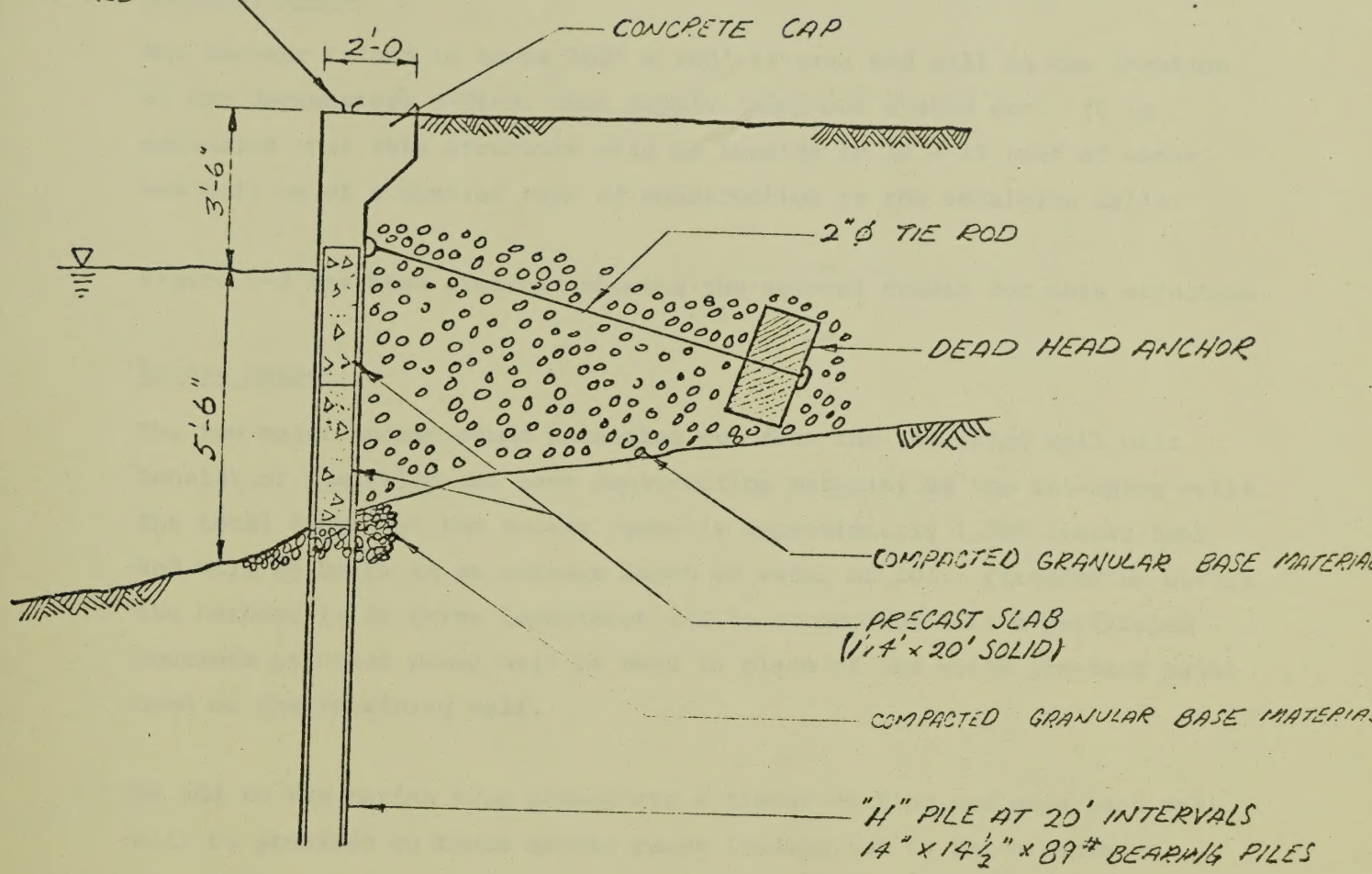


FIGURE 6-1

270
RAWAL NO

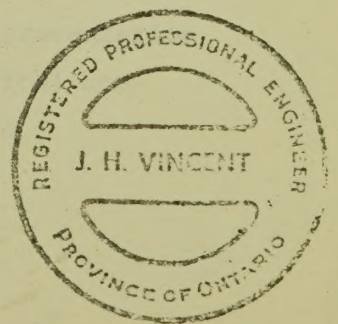
F1

CLEATS AS
REQUIRED



RETAINING WALL
N.T.S.

FIGURE 6-2



Harbour Island

The harbour island is to be 100' x 100' in area and will be the location of the dockmaster's office, fuel supply, pump out system etc. It is estimated that this structure will be located in 12 - 15 feet of water and will be of a similar type of construction as the retaining walls.

Figure 6-3 has been attached showing the general detail for this structure.

Access Ramps

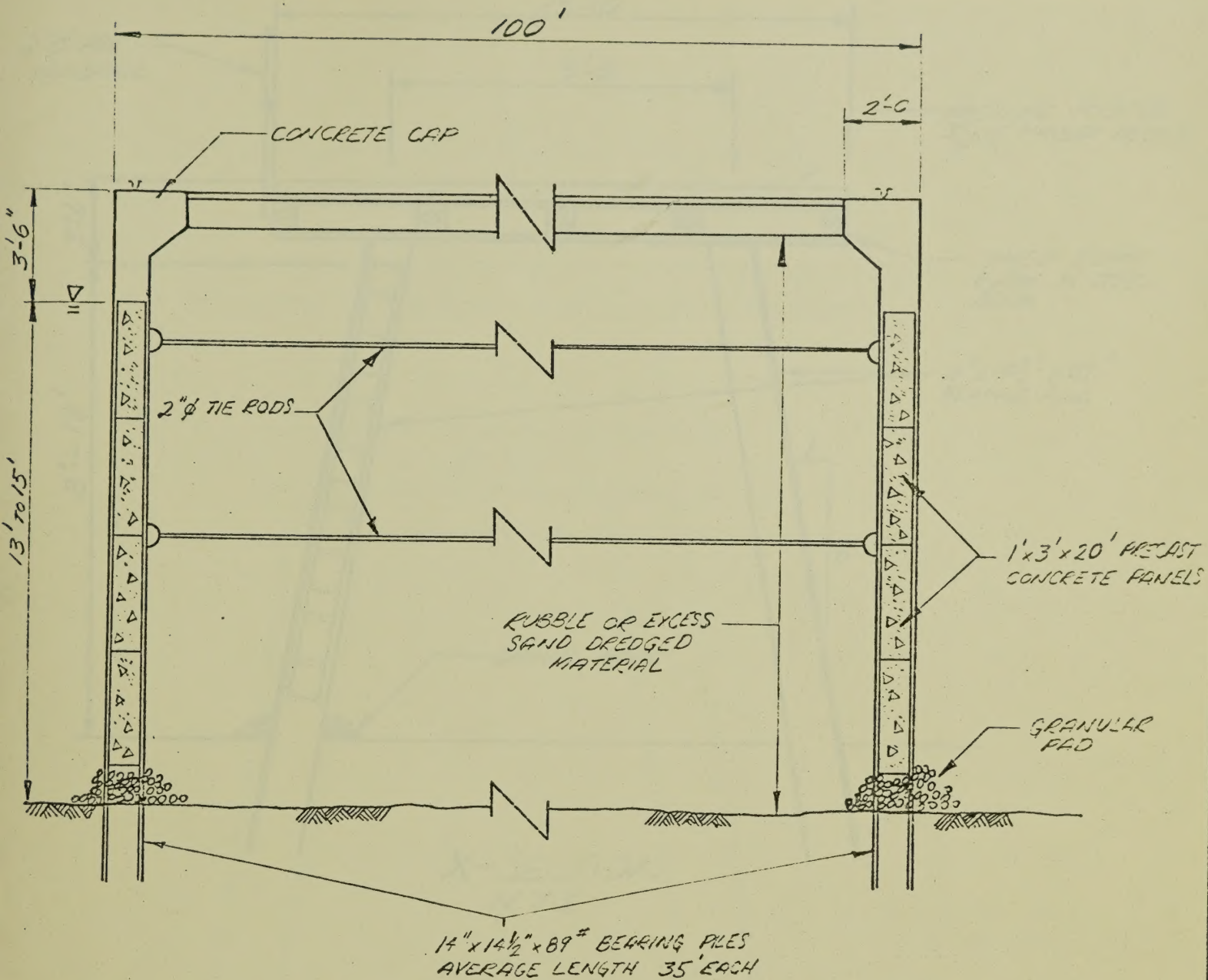
The two major access ramps extending out from the retaining wall will consist of basically the same construction material as the retaining walls. The total length of the access ramps is approximately 1,380 linear feet and will be built in an average depth of water of 10'. Circulation within the harbour is of prime importance and to accomplish this a perforated concrete pre-cast panel will be used in place of the solid pre-cast panel used on the retaining wall.

To add to the marina type atmosphere a timber decking and pipe hand rail will be provided on these access ramps leading out to the breakwater.

Figure 6-4 has been attached showing the general detail for this structure.

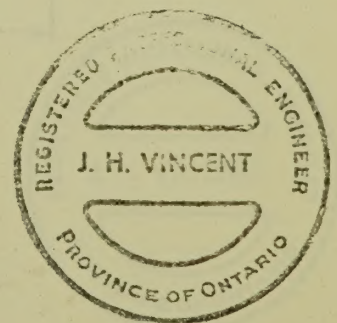
Access Docks

The access docks shall extend out from the access ramps and will provide the docking facilities for the various boats using the marina. The dock will consist of 8' x 60' double tee concrete beams supported on piles as shown in Figure 6 - 5. Two hundred and four piles and ninety-five precast beams would be required to make up two access docks. Photographs of the Olympic Site in Kingston, Ontario have been included in the presentation and show how these individual slips are supplied with electrical and water services and how a deck lighting system can be arranged.

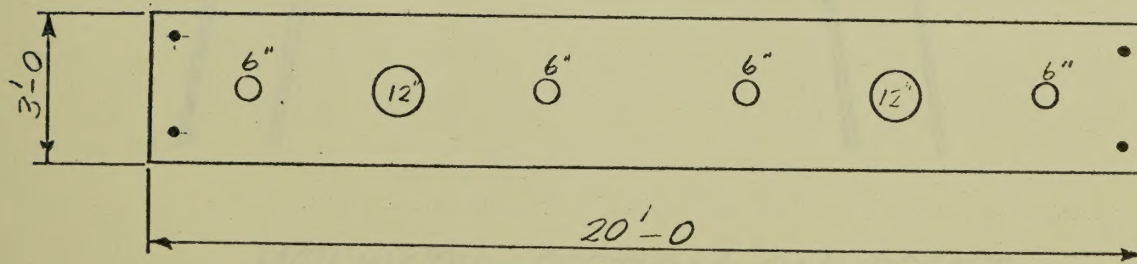
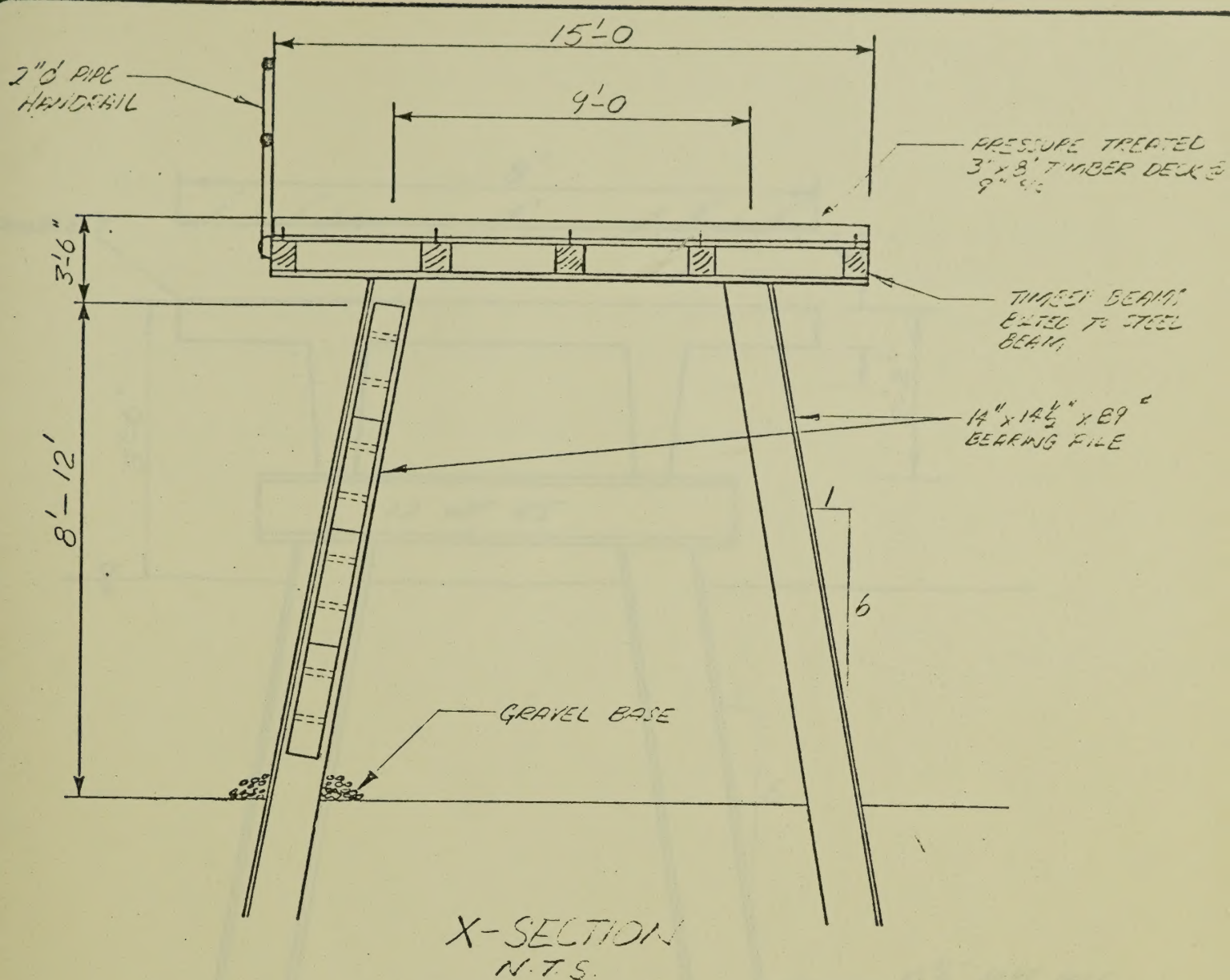


HARBOUR ISLAND
NTS

FIGURE 6-3



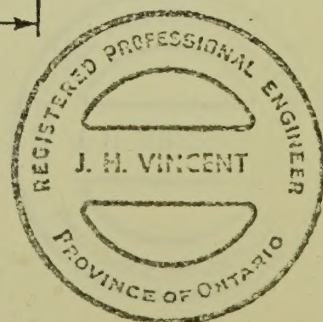
PLANISTICS
Engineering Inc.



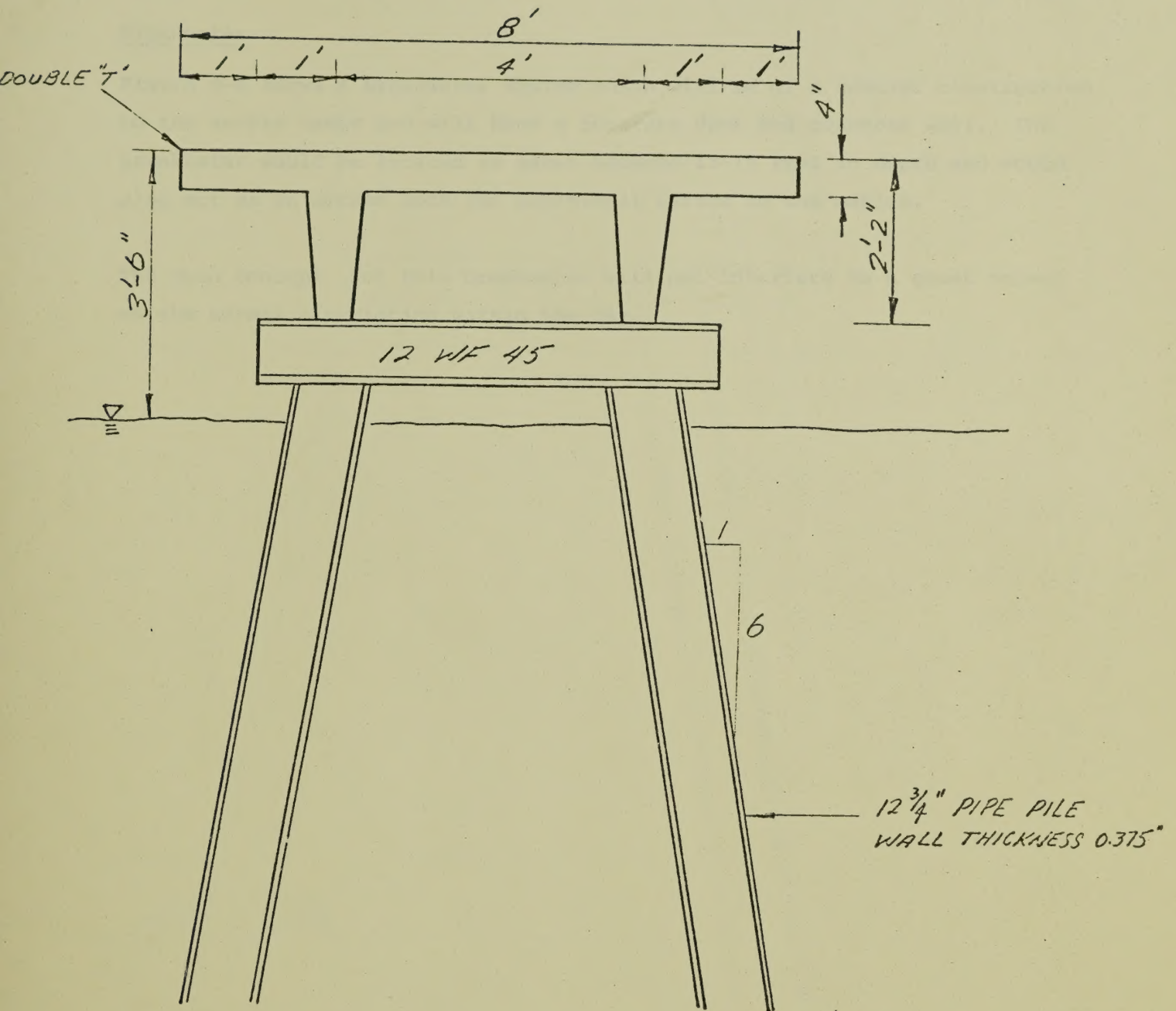
PERFORATED PRECAST SLAB

ACCESS RAMP
N.T.S.

FIGURE 6-4

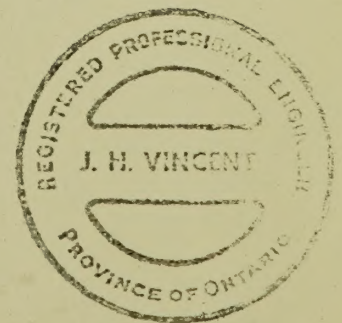


PLANISTICS
Engineering Inc



WALKWAY SECTION ON ACCESS
DOCK AT PIER CAP
N. T. S.

FIGURE 6-5



PLANISTICS
Engineering Inc.

Breakwater

Figure 6-6 shows a breakwater system which will be of a similar construction to the access ramps and will have a concrete deck and concrete wall. The breakwater would be located in water between 13-15 feet in depth and would also act as an access dock for additional berths in the marina.

The open concept for this breakwater will not interfere to a great extent on the normal circulation within the bay.

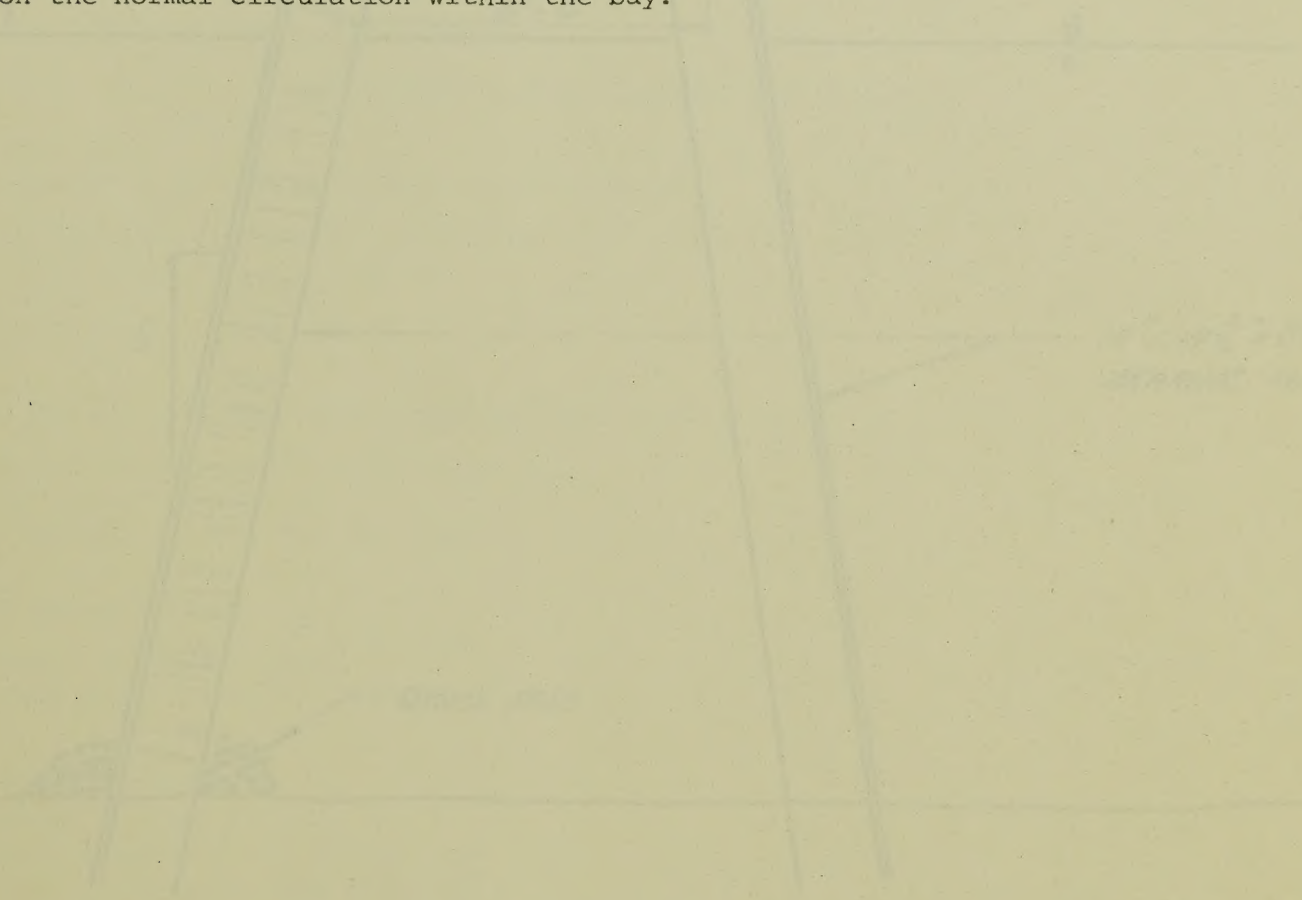
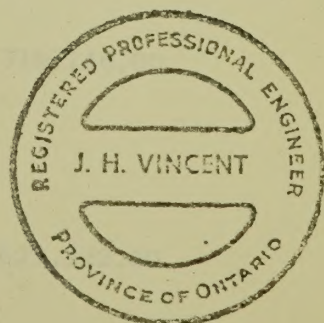
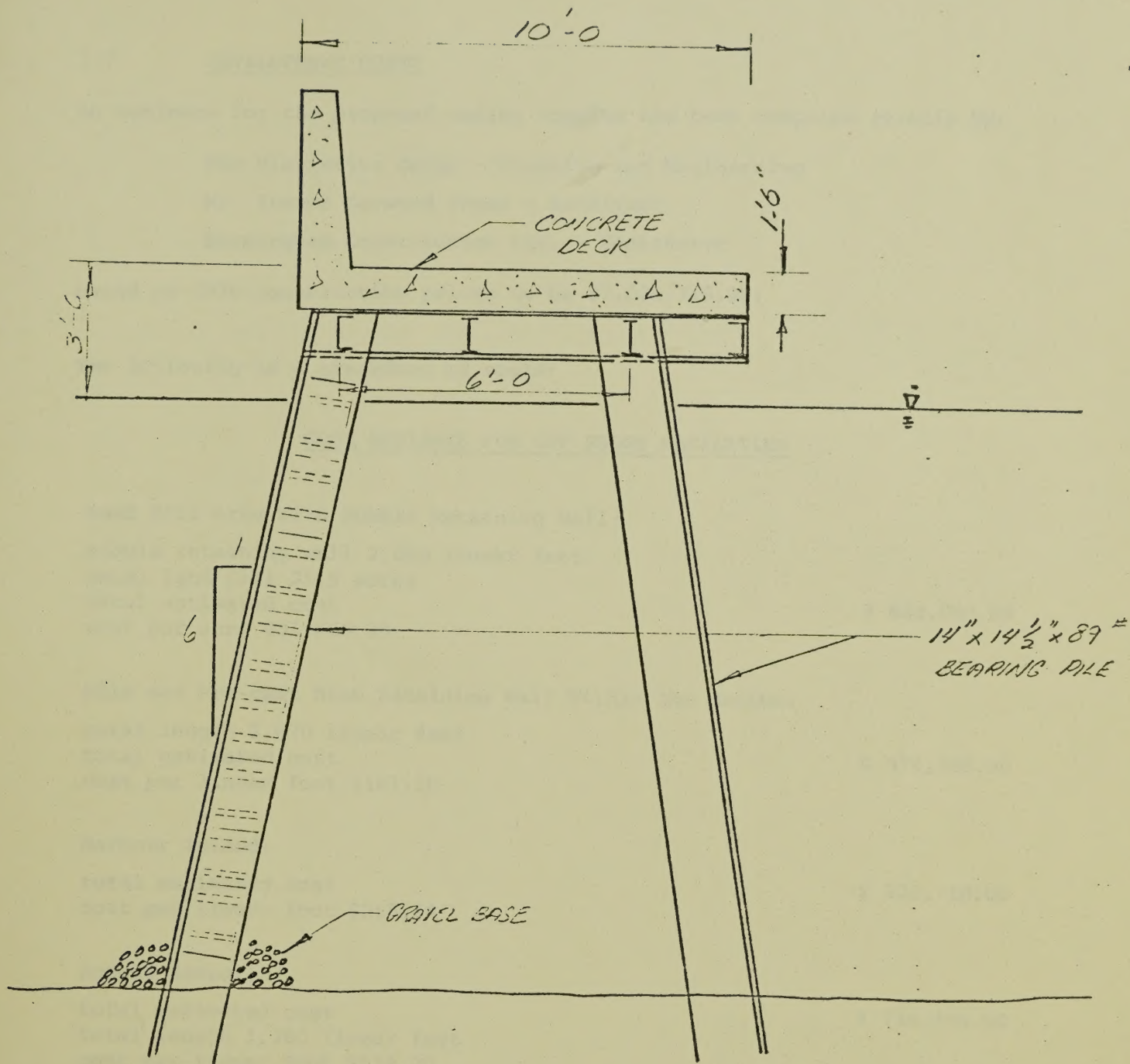


FIGURE 6-6





PLANISTICS
Engineering Inc.

2.7 DEVELOPMENT COSTS

An estimate for the proposed marina complex has been compiled jointly by:

The Planistics Group - Planning and Engineering

Mr. Trevor Garwood Jones - Architect

Birmingham Construction Ltd. - Contractor

based on 1976 construction prices to be \$7,026,716.00.

The following is a breakdown of costs:

COST ESTIMATE FOR OFF SHORE FACILITIES

Land Fill Area With Rubble Retaining Wall:

rubble retaining wall 2,080 linear feet

total land fill 25.9 acres

total estimated cost

\$ 820,000.00

cost per acre \$31,660.23

Pile and Pre-cast Slab Retaining Wall Within the Marina:

total length 2,070 linear feet

total estimated cost

\$ 374,888.00

cost per linear foot \$181.10

Harbour Island:

total estimated cost

\$ 122,710.00

cost per linear foot \$255.64

Access Ramps:

total estimated cost

\$ 716,496.00

total length 1,380 linear feet

cost per linear foot \$519.20

Access Docks:

total estimated cost

\$ 718,140.00

total length 6,860 linear feet

cost per foot \$104.68

Break Water:

total estimated cost

\$ 625,122.00

total length 1,210 linear feet

cost per foot \$516.63

Boat Hardware (Cleats, Buoys, Anchors)

total estimated cost	\$ 139,060.00
total number of berths 818	
cost per berth \$170.00 each	

Other Estimated Costs

Services to Berths:

electrical outlets, water services, fire protection	\$ 180,000.00
lighting on ramps	35,000.00
boat ramps (2)	30,000.00
boat (mobile) hoist	40,000.00
boat (fixed) hoist (2)	12,000.00
cost per berth \$363.00	
pump out on dock (pump)	2,000.00
fuel pumps and tanks	nil
sewage pumping station	100,000.00

Total Cost

\$3,915,416.00

OFFSHORE DEVELOPMENT PHASING COST

PHASE I

land fill (total)	\$ 820,000.00
retaining wall (total)	\$ 374,888.00
harbour island (total)	\$ 122,710.00
access ramps (partial)	\$ 498,432.00
access docks (partial)	\$ 213,547.00
breakwater (total)	\$ 625,122.00
boat hardware (partial)	\$ 61,370.00
other costs (partial)	\$ 233,043.00

Sub Total

\$2,949,112.00

number of berths 361
anchorage 59

PHASE II

access docks (partial)	\$ 213,547.00
boat hardware (partial)	\$ 39,440.00
other costs (partial)	\$ 84,216.00

Sub Total

\$ 337,203.00

number of berths 232 + 361 = 593
anchorage 31

PHASE III

access ramp (total)	\$ 218,064.00
access dock (total)	\$ 291,046.00
boat hardware (total)	\$ 38,250.00
other costs (total)	\$ 81,741.00

Sub Total

\$ 629,101.00

number of berths 225 + 593 = 818
anchorage nil

TOTAL

\$3,915,416.00

See Figure 7.1 for Phasing Of Off Shore Facilities.

COST ESTIMATE FOR ONSHORE FACILITIES

PUBLIC		BOAT SERVICES	CLUBHOUSE	TOTAL
PHASE I	2 tennis courts	\$ 30,000.	refreshment lounge	
	comfort station	10,000.	locker	
	parking lots	90,000.	administration	
	roads	46,000.	ancillary support	
	site development	300,000.	areas \$576,000.	
			parking lot 27,000.	
			site development 50,000.	
	TOTAL	\$476,000.	\$653,000.	\$1,389,800.
PHASE II	site development	50,000.	restaurant	
			pool	
			members lounge	
			recreational facilities	
			ancillary	
			areas 1,264,500.	
			site development 50,000	
	TOTAL	\$ 50,000.	\$1,314,500.	\$1,374,500.
PHASE III	site development	50,000.	units	
			3 tennis courts	
			252,000.	
			45,000.	
	TOTAL	\$ 50,000.	\$297,000.	\$ 347,000.
	GRAND TOTAL	\$576,000.	\$2,264,500.	\$3,111,300.

SUMMARY OF PHASING COSTS

PHASE	ONSHORE	OFFSHORE	TOTAL
I	\$1,389,800.	\$2,949,112.	\$4,338,912.
II	\$1,374,500.	\$ 337,203.	\$1,711,703.
III	\$ 347,000.	\$ 629,101.	\$ 976,101.
TOTAL	\$3,111,300.	\$3,915,416.	\$7,026,716.

Notes on cost estimates for facilities:

1. Capital cost estimates are to modern standards of heating, lighting, and air conditioning.
2. Costs are exclusive of furniture and equipment.
3. Estimated total is based on current prices and does not include architectural, engineering or financing costs.
4. Site development to include paths and general landscaping.
5. Taxes are not included.

PART THREE: THE MARINA COMPLEX

3.1 AS A VISUAL AMENITY AND FACILITY ALONG THE BEACH STRIP

The Hamilton Harbour is known for its position in industry, trade and commerce. But "Steeltown" just does not conjure up the most exotic images in the traveller's mind. The proposed marina facilities will broaden this image by visually demonstrating the range of water activities carried on at the western end of lake Ontario.

The Indian Creek site has a powerful potential for improvement of the image. One of the major contact points for the many tourists visiting the area is from the Burlington Bay Skyway. The Q.E.W. allows them to experience a dramatic overview of the site leaving with them a new image of the Burlington Bay - one of human activity and recreation.

Burlington Bay and Hamilton Harbour have an encouraging future with the Clean-up of the Bay Programme by the Ontario Ministry of the Environment and the proposed marina development at the Indian Creek site. These projects will be contributing factors in an increasing recreational role for the Bay area resulting in a more interesting balance of activities.

The construction of the marina complex as proposed will be phased over several years as outlined in Part 2.7 of this report. Phasing the construction of a project of this type has a number of advantages, such as:

- . reducing initial capital requirements
- . return of revenue to cover construction costs
- . provides berthing to fill expected market demand
- . gives time to establish a supporting club clientele
- . club members have input into what facilities are desirable.

As mentioned above, each year additional berthing can be added to fill the expected market demand and should the demand outstrip the supply, construction could be speeded up to suit. It is expected that the local market can absorb at least 250 additional wet berths per year. The phasing scheme proposed for the berthing facilities provides for:

	<u>Wet Berths</u>	<u>Dry Berths</u>
PHASE I	361	59
PHASE II	232	31
PHASE III	225	-

In addition, the onshore and club facilities will grow and be completed in conjunction as the boating capacity of the marina increases. This will give the marina management the opportunity to determine future customer needs and plan accordingly. Also, the recreational facilities will not sit idle prior to establishing an adequate supporting club membership.

3.3 THE MARINA WILL BE OPEN TO THE PUBLIC

The marina as proposed can be considered as semi-private in that half the boat berths will be available for lease to the public. The public berths will not be grouped but a higher percentage will be in the southern portion of the berthing layout. This is due to the convenience of access by members to the clubhouse and the public to the comfort station.

The proposed public facilities are not limited to use by public boaters with marina berths. Local residents or tourists may launch their boats from trailers and use the facilities for their daily recreational activities. With the planned facilities a family may like to play tennis, go for a picnic then launch their boat for a few hours of boating. Upon returning they will be able to freshen up at the comfort station before leaving or going to the clubhouse restaurant for dinner.

The preceeding scenario presents an interesting recreational opportunity to the boating public that presently does not exist along the local waterfront. The development of the proposed marina complex will provide a unique source of recreational activity on the Bay at a site which is inaccessible for public use at the present time.

3.4 AS A CLUB HEADQUARTERS

A marina with a successful club within its boundary has a great advantage. For many boat owners the social side of sailing is as important as the sport itself. A good, lively club is likely to prove a marina's greatest single asset, not only as a place where members can exchange views but also gives a marina a better economic return with a regular clientele. Also, during phased construction of the proposed marina development, member input can assist in determining which additional facilities are most desirable.

The club's recreational facilities planned for the proposed marina complex include a lounge, swimming pool, sauna and squash courts within a modern clubhouse. Here members socialize or entertain guests in a relaxed atmosphere. The recreational facilities will probably not be overtaxed by the yachtsman, however, the fact that they are available will be membership incentive.

It should be remembered that yachtsmen and their families are still land people and the more clublike features provided, the more attractive the marina.

The operation of a club at the marina is essential from an economic standpoint. The onshore club facilities are needed for a reasonable financial return. The high development and operating costs of boat servicing are more economically feasible because they draw customers to the more economic onshore club facilities. In this way, the marina complex successfully operates by effectively including loss-leader elements.

The appropriateness of the clubhouse design and the management of the associated facilities will be the important ingredients in the club's success as the financial and social heart of the marina.

3.5 AS A BASE FOR HOTEL DEVELOPMENT

A hotel development included in the onshore facilities is desirable from a convenience, service and economic standpoint. A marina operated with a resort atmosphere hotel offers a very attractive facility for club members, local residents and tourists alike. The proposed marina will attract a sailing clientele to the hotel and there will be strong ties between the hotel accommodations and the recreational facilities of the clubhouse. Only a small number of rooms and a restaurant are planned in order to maintain a relaxed atmosphere within the clubhouse.

The economic basis for the hotel is to provide additional revenue for the marina complex to compensate for the high development and operating costs of the boat servicing facilities. This allows the spread of the financial risk of the development by having an additional source of income when assessing the revenue returns. That is, if the hotel accommodations prove successful in a cost-to-revenue analysis and therefore is a good leader element, additional accommodations can be added as they are required. This will be possible because the development can be phased and is designed to allow for some expansion of these facilities.

There are a number of organizational schemes possible for marina management. However, for the proposed development a nucleus Management Board is recommended which should include:

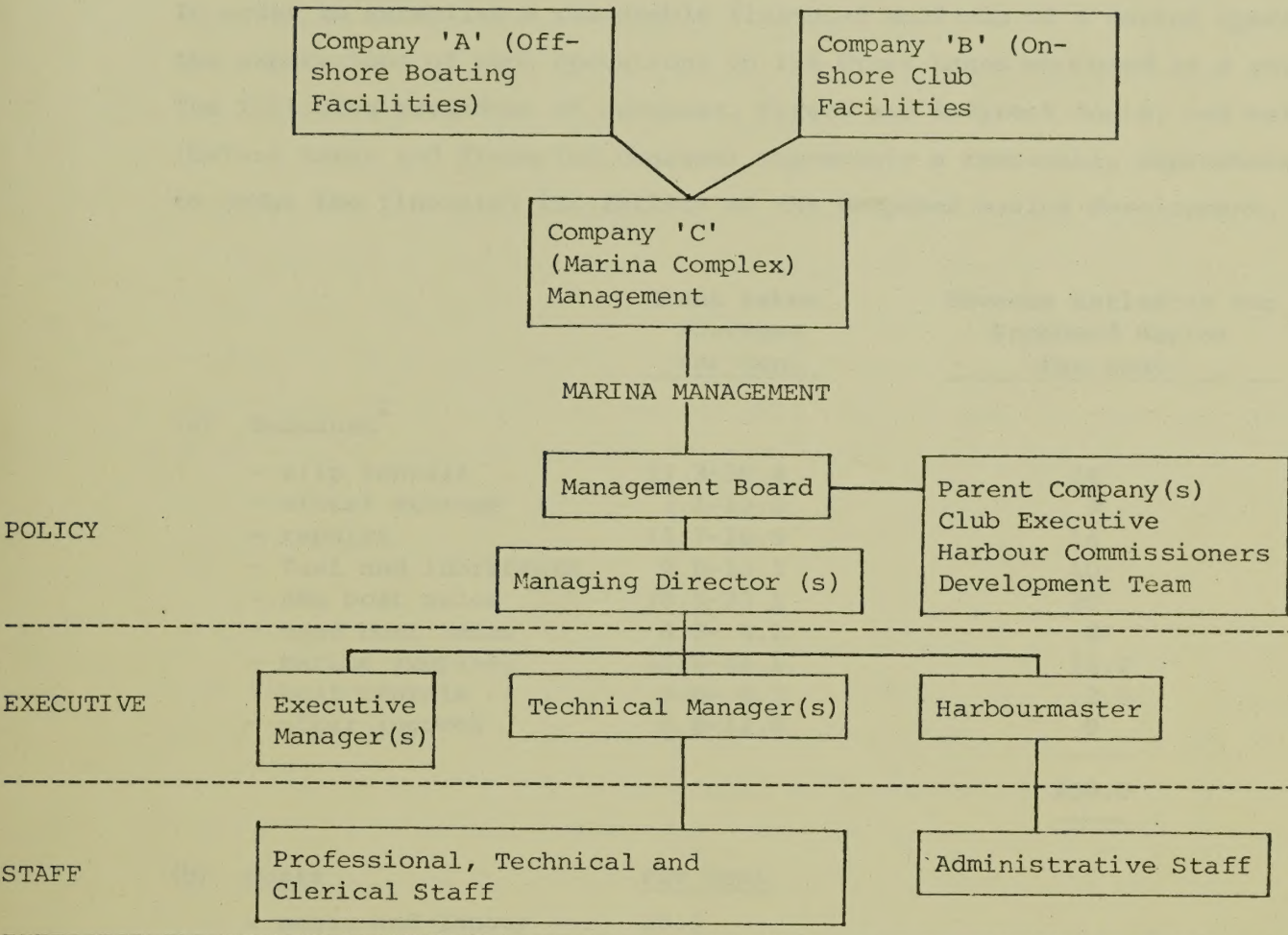
- 1) Company or Club answerable to members
- 2) Boat Service Company answerable to owners
- 3) Member(s) or representative of the Hamilton Harbour Commissioners
- 4) Specialist board consisting of Development Team members

The boat Service Company(s) and club executive on the Board will offer input to the overall management from their respective points of view. Having members of the original Development Team on the Board ensures that continuity of the project from inception is preserved. A joint management venture of these private groups and the Hamilton Harbour Commissioners will generate a good balance of local interests and technical experience into the Management Board.

The Management Board's primary concern will be to initiate and direct policy ensuring that it is implemented correctly. In order to establish a well directed operation, it will be essential that the Board formulate clear objectives by a planning and budgeting system within an agreed time period early in the development stage. For that reason the Development Team is interested in the Harbour Commissioners' views relating to formation and participation in the Marina's management scheme.

The management of the onshore and offshore facilities may be by separate companies. Together they will form a central body which maintains control of the complex by means of fundamentally co-ordinated policies. This scheme also unifies the economic returns into a central company thereby effectively utilizing the loss-leader elements.

Proposed Marina Management Scheme



PART FOUR: FINANCING THE PROJECT

4.1 MARINA ECONOMICS

In order to establish a reasonable financial analysis of a marina operation, the experiences of such operations on the Great Lakes were used as a guide.¹ The following breakdown of revenues, direct and indirect costs, and net earnings (before taxes and financial charges) represents a reasonably dependable base to judge the financial feasibility of the proposed marina development.

	<u>Great Lakes Averages Per Cent</u>	<u>Revenue Estimates for Proposed Marina Per Cent</u>
(a) <u>Revenues</u> ²		
- slip rentals	17.3-19.4	18
- winter storage	3.1-10.0	7
- repairs	11.7-16.6	14
- fuel and lubricants	9.8-10.1	10
- new boat sales	10.5-25.1	20
- used boat sales	6.9- 8.2	8
- marine supplies	10.8-13.1	12.0
- boat rentals	3.8- 4.2	2.0
- other incomes	6.6-12.8	9
		100.0
(b) <u>Costs</u>	<u>Per Cent</u>	
- wages and labour	18.5	
- costs of products sold	<u>50.0</u>	
Direct Cost	<u>68.5</u>	
- management fees	5.5	
- municipal taxes	2.5	
- utilities	1.5	
- insurance	2.0	
- interest on op. loans	3.5	
- advertising, promotion	<u>6.0</u>	
Indirect Cost	<u>22.5</u>	
(c) Net earning before taxes and financial charges		9.0 Per Cent

1) National Association of Engine and Boat Manufacturers Ltd., NAEBM's Study of Marina Revenues and Costs, Profit Ratios, Slip Rental Rates, Labour Rates and some boat owners, Impressions of Marina Services, 1969.

2) Slip rentals based on 80 per cent occupancy.

Economic Considerations

In preparing the cost estimates a conservative approach was taken so that reasonable assurance of reliable figures could be expected. The revenue and operating figures are based on Great Lakes' averages so complete accuracy is not possible. However, the development costs in Part II, Section 7 have been evaluated in site specific detail considering the proposed design and construction criteria.

The economic research suggests that incentive for complete private financing of the marina is not possible. The shortness of season along with high development and operating costs make it difficult to run a self amortizing profitable marina operation. However, if the initial costs, such as capital costs for infilling and offshore construction are financed through a joint venture with the Hamilton Harbour Commissioners and Federal grant assistance it appears that the operation of the Marina is viable on a limited income basis.

It is expected that the profitability of the marina will be marginal at best in relation to development costs. In order to assure a fair return on the investment, a hotel, restaurant and ancillary land based club facilities in conjunction with the marina are needed to make the operation a more viable economic proposition. In this manner, the high operating costs of boat servicing are offset by drawing a clientele to the more economical onshore club facilities. The marina complex operated in this manner effectively utilizes loss-leader elements to ensure a reasonable return to investors.

Figure 4.1

RATES FOR SLIP RENTAL, LAUNCHING RAMPS AND LABOUR

Great Lakes

	Slips Average Rates			Storage Average Rates		
	Daily	Monthly	Seasonal	Wet	Dry Inside	Outside
Under 16'	\$ 3.00	\$ 27.00	\$ 166.31	\$ 37.50	\$ 65.71	\$ 40.00
16' to 24'	\$ 5.00	\$ 23.75	\$ 196.94	\$ ---	\$112.19	\$ 86.67
24' to 40'	\$ 8.39	\$ 30.00	\$ 292.28	\$100.00	\$258.00	\$134.75
40 and up	\$ 11.49	\$ 35.00	\$ 402.22	\$ ---	\$175.00	\$ 50.00

Average Launching Ramp Fees:

One Way	In, Out	Daily	Seasonal
\$ 2.70	\$ 3.25	\$ 2.38	\$ 26.38

Average Labour Rates:

	Wage Rate Paid	Wage Rate Billed Customer	No. of Employees
Mechanic	\$ 5.23	\$ 12.25	3.3
Wood Carpenter	\$ 6.02	\$ 11.75	1.5
Fiberglass Repair	\$ 5.37	\$ 11.43	1.7
Painter	\$ 4.66	\$ 11.14	1.9
Yard Help	\$ 4.33	\$ 10.33	3.0
Dock Boy	\$ 2.50	\$ 5.00	2.0

Reprinted from "Marina Costs/Revenues Study - 1974". The National Association of Engine and Boat Manufacturers, New York, N.Y.

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